

## Section 6: Other Lake Huron Issues

There are a range of other issues in the Lake Huron basin which are being addressed by other programs or are beyond the current scope of the Partnership's priority issues. They are no less significant, however, so they are either being addressed domestically, through other programs or they are being tracked and over time, specific actions to address these issues may be incorporated into the Binational Partnership Action Plan.

### 6.1 Low Water Levels

Unlike the other Great Lakes, water levels in Lakes Huron (and Michigan since they share the same level) are approaching historic lows. Cyclic water level fluctuation is a natural occurrence, but recent low levels could be a regional response to global climate change. Many shoreline property owners have welcomed lower water levels since it has exposed increased amounts of beach and shoreline and reduced the potential for any property damage from erosion. Others are very concerned about exposed shorelines and the loss of existing wetlands which are being dried out as water levels drop. The low water levels that have recently occurred in Lakes Huron and Michigan are not being seen to the same extent in the other Great Lakes.

This situation created a novel regulatory issue. On the Michigan shoreline, receding water levels exposed shoreline mud flats and beaches that were colonized by emergent wetland vegetation. This represents restoration of a natural condition that has not existed for many years, and in many areas newly emerged wetlands represent a substantial increase in essential wetland habitat for fishes and waterfowl. However, some property owners, accustomed to sandy beaches and open lake, regard the new wetlands with disfavor and have attempted to secure beach grooming permits. Several cases of unpermitted vegetation removal have led to enforcement actions. The State of Michigan's Wetlands Protection and the Great Lakes Submerged Lands parts of Michigan's Natural Resources and Environmental Protection Act were recently amended to permit property owners to carry out limited vegetation removal, except in areas designated as Environmental Areas by the MDEQ, where threatened or endangered species may be impacted, or, in designated critical dune areas. The recent amendments to Michigan law designates Saginaw Bay as a pilot area that allows riparian property owners to remove certain types of vegetation from exposed bottomlands, after receiving a letter of approval from the MDEQ certifying that specified criteria are met. Vegetation removal in this pilot area is typically limited to 50 percent of a property owner's shoreline, or 100 feet, whichever is greater. A permit from the U.S. Army Corps of Engineers is required for mechanical removal of vegetation.

At the same time in some Canadian waters, particularly in Georgian Bay and the North Channel where different shoreline conditions exist, many wetlands have been significantly reduced in size through drying. This has reduced availability of critical spawning habitat for fish species such as northern pike, muskellunge and smallmouth bass. Currently, research is being conducted to assess impacts of these low water levels and compare the current situation to the historic state.

Botulism is a foodborne disease of vertebrates caused by the bacterium *Clostridium botulinum*. Infected organisms are affected by extremely potent neurotoxins produced by the bacteria. Botulism has been reported in fish-eating birds within the Great Lakes, and has caused periodic die-offs of fish-eating waterfowl and benthic fishes in Lakes Michigan, Huron, Erie and Ontario. The mechanism responsible for Great Lakes botulism outbreaks is not well understood. Monitoring is needed to determine if recent outbreaks represent an increase in frequency or a novel source of infection. Botulism outbreaks seem to be associated in some way with the spread of invasive zebra mussels and round gobies. The source and mode of toxin transfer are not fully understood, but research is underway.

## 6.2 Botulism

In recent years, outbreaks of Type E Botulism have left thousands of fish and waterbirds dead on Lake Huron (Ontario) area beaches. In 1998 and 1999, the outbreak appeared to be concentrated at the south end of the lake between Goderich and Sarnia. In 2002 and 2003, outbreaks occurred each year in the Goderich to Port Elgin area. The occurrences began in late summer and continued through the fall season until late November. There were also observations of decomposing algae collecting in embayments in the Kincardine area in the late summer. These events on Lake Huron are being studied along with similar events on Lakes Erie and Ontario to determine what conditions lead to these events.

## 6.3 Cormorants

Cormorants are fish-eating birds implicated in decreases in nearshore fish populations throughout

the Great Lakes. Cormorant abundance was increasing in the middle of the 20th century but began a sharp decline in the 1960's due to reproductive failure induced by contaminants. Recent declines in pesticides such as DDT and an increase in available prey fish (primarily exotic species such as alewives) have allowed cormorant populations to increase. Breeding colonies are now established on many offshore islands. Many Stakeholder groups perceive cormorants as a direct threat to fisheries and have called for cormorant control. This is a complex issue because cormorant effects on local fisheries appear to vary greatly among breeding colonies. Cormorants clearly have an effect on island vegetation, and their excrement has denuded vegetation on some offshore islands. This has affected other bird species such as herons that nest on vegetated island sanctuaries.

Cormorant management is contentious because there has been disagreement on the absolute need for control measures, the level of control needed, and which control method should be used. Some stakeholders view shooting or trapping as inhumane. Inducing nest failure through egg-oiling is only slightly less controversial, but it requires several years of control before numbers are reduced. This is undesirable to stakeholders who want immediate action. Some control measures have been implemented, but a basinwide plan has not yet been developed. In Ontario waters of Lake Huron, the OMNR is currently conducting an extensive study to determine cormorant impacts on fish populations in Georgian Bay and the North Channel. Egg oiling is being conducted as part of this study but any wider-scale control efforts will proceed only if a significant negative effect of cormorants on fish populations can be demonstrated.

## 6.4 Coastal Wetlands

The Lake Huron nearshore coastal wetlands sustain an extensive diversity of wildlife that enriches the Lake Huron Basin. The physical structure and living communities of this area are as much a function of the lake's ecosystem as the fish in its depths. The action of waves and wind shape the beaches, dunes, and shore bluffs. These land forms and the local climate effects determine the biological communities. These communities, in turn, sustain the diversity of wildlife.

The shoreline of Lake Huron is the longest of the Great Lakes, its length extended by the shores of its numerous islands and bays. Rocky shores associated with the Precambrian shield cover the northern and eastern shores, limestone dominates the shores of Manitoulin Island and the northern shore of the Bruce Peninsula, and glacial deposits of sand, gravel, and till predominate in the western, southern, and

south-eastern portions of the shore. Shoreline and inshore habitats are correspondingly diverse.

The nearshore area habitat represents a warm- or coolwater ecosystem that, at one time, encircled the lake. It was undoubtedly a small part of total lake volume, but it supported many locally important fisheries for bass, perch, walleye and pike. Many of these fisheries were compromised early on through over exploitation and loss of wetlands, and have largely been forgotten. Where they remain, they are an important resource.

Many nearshore areas of Lake Huron have been altered due to human influences. The once natural shorelines offered fish and wildlife significant habitat for all of their life stages. Due to development in coastal areas, many areas now have shoreline protection structures. In many cases, the narrow band of transitional vegetation is now gone.

No comprehensive estimates of coastal wetland loss for Lake Huron are available. On the northern shore of Lake Huron, loss of wetland habitat on a large scale has not occurred because most of the shoreline is sparsely populated and remote. Most losses tend to be concentrated around small urban centers on the lakeshore. Within the last 10 years, there has been incremental and site-specific loss of wetland area from agricultural encroachment, cottage development, road construction, dredging and channelization. A recent study of Saginaw Bay estimates that in seven of eight coastal counties at least 40 percent of wetlands have been lost.

## 6.5 Bacterial Contamination

The watershed of Lake Huron along its south-east shore (Sauble Beach to Sarnia) is a draw for thousands of tourists and cottagers annually as it boasts some of the finest freshwater beaches in the world. High levels of nutrients and bacteria (*E. coli*) along the beaches and in the tributaries have led to numerous postings of beaches warning of unsafe conditions for swimming. These conditions have existed for many years yet have received heightened attention due to recent media coverage. Complaints from residents about algae have been less consistent, and are sporadic geographically and over time with some years much worse than others. The relative contributions of sources of nutrients and bacteria have not been specifically quantified, however agricultural practices, municipal wastewater, septic systems and wildlife sources are all contributors.

Canadian agencies have formed a subgroup under the Lake Huron Binational Partnership to address this important domestic issue. The south-east shore working group has been working since July 2002 to coordinate activities and conduct research into the sources and causes of these impairments along the shoreline. More recently, the provincial Ministries of the Environment and Agriculture and Food have intensified their efforts under a science committee to investigate microbial sources to the lakeshore and to better understand the contributions from different sources.

## 6.6 Blue-green Algae Blooms in Georgian Bay

Recent occurrences of blue-green algae blooms in the protected bays and inlets of Georgian Bay have led to increased concern about inputs of nutrients from shoreline cottages and developments. In the fall of 2003, Sturgeon Bay, a small inlet along the north-east coast of Georgian Bay just north of Parry Sound, was subject to a warning from the local health unit advising residents to restrict use of water from the bay for any purposes including swimming, drinking, bathing, and any other domestic uses. This has alarmed local residents and cottagers and has increased concern amongst the many other Georgian Bay locations that may be subject to the same limnological conditions and inputs as Sturgeon Bay. Further monitoring and research is planned for 2004 and the Township of the Archipelago will be launching an education campaign to inform local residents about what they can do to reduce nutrient releases from their properties.

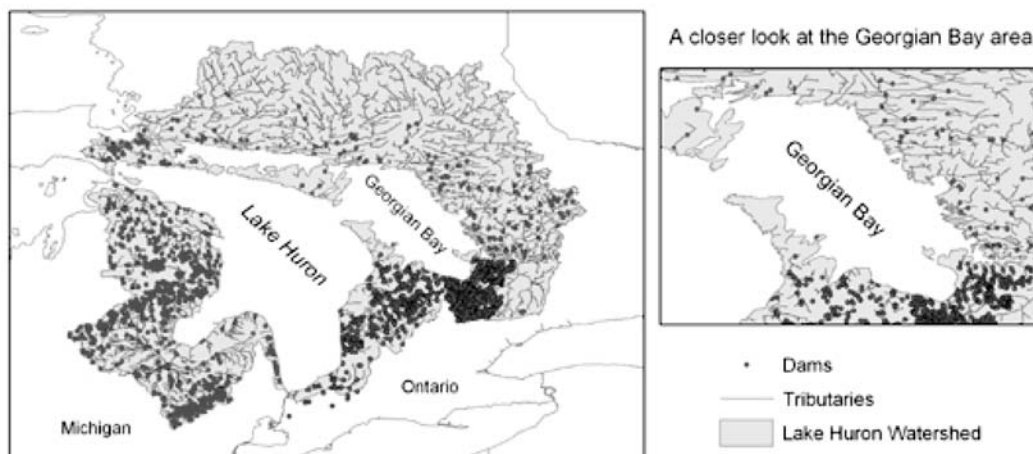
## 6.7 Tributary Access for Spawning Fish

Many fishes need to migrate between different habitats throughout their life histories. In the past, Lake Huron was connected to diverse array of stream and inland lake habitats. Historically, tributaries were

important sources of cool, high quality water, and they served as spawning and nursery habitats for many species. Fish were excluded from many of these areas in the 1800's through construction of mill dams and later through hydroelectric facilities. As shown in Figure 6.1 [below] dams now fragment many streams where historical spawning occurred for adfluvial fish (live in the open waters of the Great Lakes and use tributaries for spawning). For example, 106 dams occur in the watershed of the Au Sable River, Michigan, a high quality trout stream. Included are six large hydroelectric dams, which impound nearly all the highest gradient rapids on the lower river. These dams impound over 26 percent of the river's mainstream warm downstream reaches lessening their suitability for coldwater fishes and, prevent Great Lakes fishes from accessing 93 percent of the mainstream Au Sable River (Zorn and Sendek 2001). Many important fisheries and spawning rapids are no longer accessible.

Figure 6.1

### Dams in the Lake Huron Watershed



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## 6.8 Aquaculture

In Lake Huron, rainbow trout are stocked into floating pens at small size, fed prepared diets, and harvested when they reach marketable size. Currently these operations occur only in Ontario waters of Lake Huron and are mostly located in the North Channel. These operations support high fish concentrations that produce fecal material that can degrade water quality and alter benthic environments below pen rearing facilities. Proper siting of these facilities is critical, but aesthetic concerns can arise even in areas with suitable water circulation.

Additional concerns regarding these operations include introduction of unwanted organisms, diseases, or parasites. These can be introduced in shipments of eggs or young fish, and fish are known to escape rearing facilities. Rainbow trout were introduced into Lake Huron well over 100 years ago and have become naturalized, thus escaped pen reared fish would not represent a new introduction; however, interactions between pen reared escaped fish and naturalized rainbow trout are unknown. Despite these problems the industry provides a desired product with significant economic benefits and is working with various levels of government to develop technologies and best management practices to ensure ecological sustainability.

## 6.9 Global Climate Change

Global climate change may already be affecting Lake Huron by altering water levels. If current trends continue, further reductions in water level may be expected. This would exacerbate navigation and beach vegetation issues. A wide range of fisheries issues could occur if Lake Huron experienced additional warming: expansion of the near-shore fish community into deeper areas, increases in fish populations that are presently temperature limited (particularly alewife), and range expansion of both native and introduced fishes that are presently restricted to Lake Erie are possible. Global climate change may also

cause greater demand for fresh water, and any reduction or loss of fresh water in other regions of North America would heighten water demand and place greater pressure on Great Lakes residents to allow water withdrawal. While this might benefit the region economically, it opens the door to ecological, economic, and social issues that have not been considered.

### **6.10 Low-Level Contaminants**

Recent advances in chemical detection techniques have revealed the presence of low concentrations of chemical contaminants that were previously not known to be present. Studies in other aquatic systems have detected a wide range of chemicals including personal care products (soaps and perfumes), human and veterinary drugs (antibiotics), natural and synthetic hormones, plasticizers, insecticides, fire retardants, and caffeine from coffee drinkers. Concentrations of these chemicals almost never exceed standards set for drinking water, but there are no standards for many substances because it was not known that they were even present. The primary concern with low-level contaminants is that they may serve as endocrine disruptors that affect growth, maturation, and reproduction of aquatic organisms. The problem is so new that many basic questions are as yet unanswered.